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Research Article

Clinical Profile and Prescription-Pattern in Ischemic Heart Disease inpatients of Tertiary Hospital of Eastern Nepal; A Record-Based Descriptive Study

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Abstract

Background and Aims: Ischemic heart diseases are conditions resulting from reduced blood supply to the myocardium. Documentation and analysis of these patients' clinical profile and prescription-pattern is required to acquire knowledge about these patients in local context and to give feedback to the involved physicians. This study aims to funnel the Clinical Profiles, investigation findings, Prescription-Pattern and ADRs among ischemic heart disease inpatients of B.P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal.

Methods: It was a record-based descriptive cross-sectional study which included 165 ischemic heart disease inpatients from the Hospital. Inpatient files of past one year (Nepalese Calendar) was obtained from Hospital record section. Data entry was done using epidata version. 3.1. Univariate Analysis was done using IBM SPSS 21.

Results: Most patients were male (60.37%), dependent (62.42%) and had median age of 62 (54 - 70) years. STEMI (58.79%) was the most common diagnosis. Tobacco consumption (50.3%), Alcohol use (22.8%), Diabetes (25%) and Hypertension (43.1%) were frequent. Typical Chest pain (60.6%), Dyspnea (42.0%) and Diaphoresis (23.7%) were the common presenting symptoms. Median day of hospital stay was 4 (0 - 62) days. About 54.0% patients had anemia and 41.6% had Leukocytosis. Aspirin (100.00%), Clopidogrel (97.55%) and HMG-CoA inhibitor (97.55%) were used in almost all patients. No ADR documentation was found.

Conclusion: Our study established conventional clinical profiles, investigation findings and prescription-pattern among Ischemic Heart Disease inpatients, however, ADR documentation was not found.

Keywords: *Clinical Profile; Ischemic Heart Disease; Nepal; Prescription-Pattern*

Abbreviations

ACE: Angiotensin Converting Enzyme; ACS: Acute Coronary Syndrome; ADR: Adverse Drug Reaction; ARB: Angiotensin Receptor Blocker; *BMJ: British Medical Journal;* BP: Blood Pressure; BPKIHS: BP Koirala Institute of Health Sciences; CAD: Coronary Artery Disease; CK: Creatinine Kinase; CKMB: Creatinine Kinase-Myocardium Brain; GTN: Glyceryl Trinitrate; HMG: 3-hydroxy-3-methylglutaryl; HS: Hora Somni; IBM: International Business Machines; IHD: Ischemic Heart Disease; IQR: Inter-Quartile-Range; IRC: institutional Review Committee;

LEVF: Left Ventricular Ejection Fraction; MBBS: Bachelor of Medicine, Bachelor of Surgery; MD: Doctor of Medicine; PCI: Percutaneous Coronary Intervention; SD: Standard Deviation; SPSS: Statistical Package for the Social Sciences; STEMI: ST Segment Elevated Myocardial Infarction; WBC: White Blood Cell; WHO: World Health Organization

Introduction

Ischemic heart diseases (IHD) are conditions resulting from reduced blood supply to the myocardium. These are most common cause of death worldwide representing 12.7% of total global mortality [1-3]. Age (4^{th} and 5^{th} decade), male sex, family history of premature heart diseases, smoking, high blood pressure, Diabetes, physical inactivity, overweight, high blood cholesterol are commonly associated with IHD [4]. Polypharmacy is necessary in IHD inpatients leading to chances of several ADRs and drug interactions which are mostly overlooked due to seriousness of the disease itself [5].

Causes and effects of IHD along with the prescription pattern among these patients available in current literature are mostly derived from the studies done in the western world. Local data regarding common associated conditions (both causes and effects) are mostly lacking in our part of the world.

Therefore, we conducted the study to snapshot Clinical Profiles, Investigation findings, Prescription-pattern and Adverse drug reactions (ADRs) among IHD inpatients in our part of the world.

Methods

It was a record (file)-based retrospective descriptive cross-sectional study conducted at B.P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal. Medical record files of IHD diagnosed patients admitted between 13^{th} April 2016 - 12^{th} April 2017 (One-year Nepalese calendar year- Baisak 2073-Chait 2073) were included in the study. Those leaving against Medical Advice (LAMA) i.e. not availing hospital-care till the time scheduled by the clinician, were excluded from the study. It was a convenience sampling (non-probability sampling). Sample size for the study was calculated using OpenEpi, Version 3, open source calculator SS Propor i.e.

Sample size, $n = [DEFF*Np(1-p)]/ [(d2/Z21-\alpha/2*(N-1) +p*(1-p)] = 150$

where,

Population of IHD from the record section last year (N): 244

Hypothesized % frequency of outcome factor in the population (p): 50%+/-5

Confidence limits as % of 100 (absolute +/- %) (d): 5%

Design effect (DEFF): 1

Again adding 10% to avoid various known and unknown biases, sample size became, 150+15 = 165.

Demographic information, risk factors of IHD, signs and symptoms at presentation, investigation findings, prescription-pattern and adverse drug reactions from the in-patient files from Hospital Medical Record Section were retrieved in a semi-structured proforma. Data entry software epidata ver. 3.1 was employed for data-entry and univariate analysis was done using IBM SPSS software ver. 21.

Ethical clearance was taken from the institutional Review Committee (IRC) of BPKIHS. Appropriate permission from the concerned department (Internal Medicine) was taken and confidentiality of the participants were strictly maintained by coding.

Case definitions

- **Clinical profiles**: Any medically defined conditions associated with IHD.
- **Investigation findings**: Result obtained by running any investigation on IHD patients.
- **Prescription-pattern:** Any drug related factor during documentation IHD patients.
- **Adverse drug reactions (ADRs):** Any unintended result of drug use.

Results

Most (65%) IHD inpatients were male and dependents (62.42%). STEMI (58.79%) was the most common diagnosis. Clinical Profile (Table 1), Investigation findings (Table 2), Cardiac function tests (Table 3) and Prescription-Pattern (Table 4) are summarized. Altogether, 50 (30.3%) IHD inpatients underwent interventional treatment (Percutaneous Coronary Intervention).

Clinical Profile	Frequency (Percent)	Missing data (Frequency)*
History		
Tobacco Use	80 (50.3%)	6
Alcohol consumption	36 (22.8%)	7
Diabetes	40 (25%)	5
Hypertensive	69 (43.1%)	5
Family history of premature Coronary Artery Disease	0 (0%)	93
Signs and Symptoms		
Typical chest pain	94 (60.6%)	10
Dyspnea	66 (42.0%)	8
Diaphoresis	37 (23.7%)	9
Nausea/ vomiting	17 (11.0%)	10
Dizziness	10 (6.4%)	8
Epigastric pain	4 (5.3%)	89
Diarrhea	2 (2.7%)	90

Table 1: *Clinical profile of IHD patients (N = 165).*
**Missing data=file where the concerned variable is not mentioned i.e. neither No nor Yes or the record-file, where the page bearing the concerned variable is missing".*

Investigation Findings	Frequency (Percent)	Missing data* (Frequency)
Urine Routine Analysis		
Urine Albumin Positive	29 (36.7%)	86
Hematological Parameters		
Hemoglobin <12g/dl	74 (54.0%)	28
White Blood Cell count > 11000/mm^3	57 (41.6%)	28
Among those with WBC > 11000/mm^3, Neutrophils > 70%	35 (66.0%)	4
Biochemical Parameters		
Random blood sugar > 200 mg/dl	27 (24.5%)	55
Serum Potassium within 3.5 - 5.0 mmol/L	119 (88.1%)	30
Serum Sodium within 136 - 146 mmol/L	79 (58.5%)	30
Creatinine above 1.3 mg/dl	26 (19.1%)	29
Cardiac Parameters		
Cardiac-specific troponin raised	98 (89.1%)	55
Creatinine Kinase (CK) MB raised	96 (82.1%)	48

Table 2*: Investigation findings (N = 165).*
**Missing data=file where the concerned variable is not mentioned i.e. neither no or yes or the record-file, where the page bearing the concerned variable is missing".*

Other Parameters	Range	Mean	SD	Median	1st Quartile	3rd Quartile	Missing data	Unit or Normal Range
Age	24 - 87			62	54	70	0	Years
Admitted for	0 - 62			4	2	6.7	0	Days
Cardiac Findings								
LEVF	15 - 75	43.08	14.52				113	55 - 70%
CKMB	12 - 538			89	35	190	48	18 - 25 U/L

Table 3: *Other parameters including cardiac function (N = 165).*
**Missing data=file where the concerned variable is not mentioned i.e. neither no or yes or the record-file, where the page bearing the concerned variable is missing".*

Drug Prescribed with Generic prescription (%)	Prescribed Frequency (%)	Route	Dose	Duration
1. Streptokinase (50.00%)	8 (4.91%)	Intravenous	1.5 million units slow iv	Only once
2. Aspirin (1.84%)	163 (100.00%)	Oral	300 mg stat and 150 mg once daily	Continued at discharge
3. Clopidogrel (1.26%)	159 (97.55%)	Oral	75 mg once daily	Continued at discharge
4. Heparin (2.82%)	71 (43.56%)	Subcutaneous	40 mg once daily to 60 mg twice daily	For 5 days
5. β-blocker (2.85%)	105 (64.42%)	Oral	Metoprolol or equivalent 12.5 mg once daily to 25 mg twice daily	Continued at discharge
6. Nitrates (2.60%)	77 (47.24%)	Oral	Isosorbide dinitrate 5mg once daily and as needed to Isosorbide Mononitrate 10 mg twice daily.	Continued at discharge
7. ACE-inhibitor (3.41%)	88 (54%)	Oral	Enalapril 5 - 10 mg or other equivalents "pril"	Continued at discharge
8. HMG-CoA inhibitor (0.00%)	159 (97.55%)	Oral	Atorvastatin 10 - 80 mg OD or equivalent 'statins"	Continued at discharge
9. Morphine (100%)	31 (19.02%)	Intramuscular	3 mg stat once and as needed	Discontinued at discharge
10. Benzodiazepine (20.00%)	65 (39.88%)	Oral	Alrazolam 0.25 mg/Diazepam 5 mg once at bedtime.	Discontinued at discharge
11. Laxative (13.41%)	82 (50.31%)	Oral	Lactulose/ Premaffin 15 ml once at bedtime daily	Continued if required
12. Calcium-Channel-blocker (100%)	10 (6.13%)	Oral	Amlodipine 5 mg once daily/ Diltiazem 60 mg twice daily	Continued if required
13. Potassium-channel-blocker (17.61%)	17 (10.43%)	Oral	Nicorandil 20 mg once daily	Continued if required
14. Acid Suppressants (50.40%)	125 (76.69%)	Oral	Pantoprazole 40 mg once daily	Continued if required
15. Angiotensin Receptor Blocker (ARB) (20.00%)	10 (6.13%)	Oral	Losartan 25 - 100 mg/ Telmisartan 40 mg per day	Continued if required
16. Antibiotics (22.50%)	40 (24.54%)	Oral	Diverse as per etiology	Course completed
17. Other drugs	72 (44.17%)			
Total number of drugs prescribed	1282			
Average number of drugs prescribed per patients	7.87			

Table 4: *Prescription pattern of medical treatment received in the hospital (N = 163).*
While collecting data for drugs used, two drug prescription records (cardex) were missing.

Discussion

Clinical profile (Table 1 and 3)

Most (65%) IHD inpatients were male and dependents (62.42%) with median age being 62 years (IQR = 54 - 70). Male and increasing age are the established risk factors of IHD [6,7]. Median hospital stay was four days in our study. Study by Heller., *et al*. had specified 3 - 10 days is adequate for hospital admitted Acute Coronary Syndrome (ACS) patients [8]. Tobacco Use, Alcohol consumption, Diabetes Mellitus and Hypertension are considered the known risk factors [4] of IHD. These were also found more frequent in our study sample than in general population. However, not a single family history of premature CAD was documented. It may be because of lack of precise diagnosis of Premature CAD made in the past or may be due to poor documentation.

Investigation findings (Table 2 and 3)

Anaemia (Hb < 12 g/dl) was present in more than 50%. Anaemia is a known risk factor for MI [9]. Leucocytosis with neutrophilic predominance in our study was common to several other similar studies [10,11]. Median SGOT (AST) was more than two times raised. AST is one of the non-specific markers of myocardial damage [12,13]. Mean Left Ventricular Ejection Fraction (LVEF ± SD) was 43.08 ± 14.524. Normal LVEF is 55 - 70% [14]. Systolic failure because of IHD may account for this loss of LVEF [13].

Treatment, prescription pattern (Table 4), ADRs and outcome

In most drugs, except Morphine, brand prescription was more popular than Generic (Table 4, 1st column). It is the case scenario in most developing countries of the world [15,16].

Most patients in our set-up (69.7%) were managed by only medical treatment, however, Primary Percutaneous Coronary Intervention (Primary PCI) is regarded as the first line treatment [4]. Most patients do not undergo interventional treatment probably because of high cost or delayed presentation or both. Streptokinase was prescribed only in eight cases. Since only 50 cases received primary Percutaneous coronary intervention, fibrinolysis with Streptokinase was expected in more cases. Relatively less use of fibrinolytics may reflect the dreaded ADRs and contraindications of Streptokinase [13].

Aspirin (100%), Clopidogrel (97.55%) and HMG-CoA Reductase inhibitor (97.55%) were prescribed in almost all cases as anticipated [13]. Heparin (43.56%), β-blocker (64.42%) and Nitrates (47.24%) were expected in more patients but were less used [13]. It may be because of contraindications and fear of ADRs. There was not a single ADR reported. It must be because of poor identification or documentation or both.

Case Fatality Rate of IHD was 9.70% in our study which was similar to the data from other developed countries [17].

Strength of the Study

Strength of the study is that it was a file-based study, used less resources and was able to give feedback to the hospital in relatively very short time-span. To our knowledge, it is the first study from Nepal with such file-based descriptive approach among IHD inpatients.

Limitation of the Study

Limitation is that many data were lost at the time of data-collection. In many case, illegible handwriting and dim ink were bothering correct reading of the data. Internal Validity has suffered.

Conclusion

The clinical profile of the IHD inpatients in BPKIHS established the conventional risk factors, signs and symptoms. Investigation findings showed Anemia, Leucocytosis with neutrophilic predominance, raised CKMB, increased SGOT, decreased mean LVEF and Cardiac-specific troponin positivity. Regarding treatment, most underwent only medical treatment. Aspirin, Clopidogrel and Statin were given to all patients, however, only about 50% received Heparin, β-blocker and Nitrates. No single ADR was documented in file records and brand prescription was more common than Generic.

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Conflict of Interest

None.

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